

CLAIMS

I claim:

1. A centrifugal separation system comprising:

fluid delivery means to provide fluid flow;

5 a separation chamber to separate unwanted material from said fluid; and

a collector to collect said separated material.

2. A centrifugal separation system according to claim 1 wherein said fluid delivery means comprises a motor.

10 3. A centrifugal separation system according to claim 1 wherein said fluid delivery means comprises an electrical motor.

4. A centrifugal separation system according to claim 1 wherein said fluid delivery means comprises a motor powered by combustion.

15 5. A centrifugal separation system according to claim 1 wherein said fluid delivery means is powered by compressed gas.

6. A centrifugal separation system according to claim 1 wherein said fluid delivery means is powered by a flowing fluid.

20 7. A centrifugal separation system according to claim 1 wherein said separation chamber is cylindrical.

8. A centrifugal separation system according to claim 1 wherein said fluid delivery means comprises an impeller assembly.

9. A centrifugal separation system according to claim 1 wherein said fluid delivery means comprises a centrifugal pump.

10. A centrifugal separation system according to claim 1 wherein said fluid delivery means comprises propellers.

5 11. A centrifugal separation system according to claim 1 wherein the pressure in said collector is greater than the pressure in said chamber.

12. A centrifugal separation system according to claim 1 that is capable of separating large objects, such as nails, screws, nuts, dirt, and sand, as well as small particles, such as dust and other particulate matter.

13. A centrifugal separation system according to claim 1 further comprising an inner tube and an outer tube, said inner tube and outer tube forming an annular duct.

15 14. A centrifugal separation system according to claim 1 further comprising:

an inner tube and an outer tube, said inner tube and outer tube forming an annular duct; and

flow straightening vanes provided within said annular duct to straighten said fluid flow.

20 15. A centrifugal separation system according to claim 1 further comprising an inner tube and an outer tube, said inner tube and

outer tube forming an annular duct and ending in a toroidal vortex nozzle.

16. A centrifugal separation system according to claim 1 wherein said collector is removable for emptying the contents of said collector.

17. A centrifugal separation system according to claim 1 wherein said collector further comprises a door for emptying the contents of said collector.

18. A centrifugal separation system according to claim 1 wherein said collector further comprises a removable stopper for emptying said collector.

19. A centrifugal separation system comprising:
fluid delivery means to provide fluid flow;
a separation chamber to separate unwanted material from said fluid; and

a collector to collect unwanted materials;
an opening in the wall of said centrifugal separation chamber, said opening leading into said dust collector;
an outer tube coupled to said centrifugal separation chamber; and

an inner tube located inside said outer tube, said inner tube and said outer tube being coaxial, wherein the gap between said inner tube and said outer tube forms an annular duct.

20. A centrifugal separation system according to claim 19 wherein said fluid delivery means comprises a motor.

21. A centrifugal separation system according to claim 19 wherein said fluid delivery means comprises an electrical motor.

5 22. A centrifugal separation system according to claim 19 wherein said fluid delivery means comprises a motor powered by combustion.

23. A centrifugal separation system according to claim 19 wherein said fluid delivery means is powered by compressed gas.

10 24. A centrifugal separation system according to claim 19 wherein said fluid delivery means is powered by a flowing fluid.

25. A centrifugal separation system according to claim 19 wherein said separation chamber is cylindrical.

15 26. A centrifugal separation system according to claim 19 wherein said fluid delivery means comprises an impeller assembly.

27. A centrifugal separation system according to claim 19 wherein said fluid delivery means comprises a centrifugal pump.

28. A centrifugal separation system according to claim 19 wherein said fluid delivery means comprises propellers.

20 29. A centrifugal separation system according to claim 19 wherein the pressure in said collector is greater than the pressure in said chamber.

30. A centrifugal separation system according to claim 19 wherein said centrifugal separation system is capable of collecting large objects, such as nails, screws, nuts, dirt, and sand, as well as small particles, such as dust and other particulate matter.

31. A centrifugal separation system according to claim 19 further comprising:

flow straightening vanes provided within said annular duct to straighten said fluid flow.

32. A centrifugal separation system according to claim 19 wherein said inner and outer tubes end in a toroidal vortex nozzle.

33. A centrifugal separation system according to claim 19 wherein said collector is removable for emptying the contents of said collector.

34. A centrifugal separation system according to claim 19 wherein said collector further comprises a door for emptying the contents of said collector.

35. A centrifugal separation system according to claim 19 wherein said collector further comprises a removable stopper for emptying said collector.

36. A method of centrifugally separating matter from a fluid comprising the steps of:

delivering a fluid flow to a separation chamber; and

allowing said matter to carry into a collector.

37. A method according to claim 36 wherein said fluid flow is delivered from an inner tube.

5 38. A method according to claim 36 wherein said fluid flow exits from said separation chamber via an annular duct created between an inner tube, said inner tube being for delivering said fluid flow, and an outer tube, said inner tube and said outer tube being coaxial.

10 39. A method according to claim 36 further comprising the step of creating a higher pressure in said collector than in said centrifugal separation chamber such that circular fluid flow is maintained without impeding said matter from carrying into said collector.

15 40. A method according to claim 36 wherein said fluid flow exits from said centrifugal separation chamber via an annular duct created between an inner tube, said inner tube being for delivering said fluid flow, and an outer tube, said inner tube and said outer tube being coaxial, wherein said annular duct
20 straightens said fluid flow.

41. A method according to claim 36 further comprising the step of providing concentric inner and outer tubes for delivering and

expelling said fluid, said annular duct ending with a toroidal vortex nozzle.

42. An apparatus according to claim 1 wherein said fluid delivery means comprises an impeller that moves air through the system as well as creates a cylindrical vortex fluid flow.

43. An apparatus according to claim 1 wherein said fluid delivery means comprises an propeller that moves air through the system as well as creates a cylindrical vortex fluid flow.

44. An apparatus according to claim 1 wherein said fluid delivery means comprises a centrifugal pump that moves air through the system as well as creates a cylindrical vortex fluid flow.

45. A method according to claim 36 wherein said delivering is performed by an impeller, wherein said impeller performs the step of creating a cylindrical vortex fluid flow.

46. A method according to claim 36 wherein said delivering is performed by a propeller, wherein said propeller performs the step of creating a cylindrical vortex fluid flow.

47. A method according to claim 36 wherein said delivering is performed by a centrifugal pump, wherein said centrifugal pump performs the step of creating a cylindrical vortex fluid flow.